Translation

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference	FOR FURTHER ACTION	See Form PCT/IPEA/416
PCT0322ND		
International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/JP2004/000053	08-01-2004	10-01-2003
International Patent Classification (IPC) or national classification and IPC		
G02B 5/30, G02F 1/1335, 1/13357, 1/13363		
Applicant		
NITTO DENKO CORPORATION		

1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 5 sheets, including this cover sheet.
3. This report is also accompanied by ANNEXES, comprising:
   a. ☒ *(sent to the applicant and to the International Bureau)* a total of 2 sheets, as follows:
      ☒ sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).
      ☐ sheets which supersedes earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.
   b. ☐ *(sent to the International Bureau only)* a total of (indicate type and number of electronic carrier(s))
      _____, containing a sequence listing and/or tables related thereto, in electronic form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).
4. This report contains indications relating to the following items:

☒	Box No. I	Basis of the report
☐	Box No. II	Priority
☐	Box No. III	Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
☐	Box No. IV	Lack of unity of invention
☒	Box No. V	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
☐	Box No. VI	Certain documents cited
☐	Box No. VII	Certain defects in the international application
☐	Box No. VIII	Certain observations on the international application

Date of submission of the demand	Date of completion of this report
Name and mailing address of the IPEA/	Authorized officer
Facsimile No.	Telephone No.

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.
PCT/JP2004/000053

Box No. I Basis of the report

1. With regard to the **language**, this report is based on:

☐ the international application in the language in which it was filed

☐ the translation of the international application into _____, which is the language of a translation furnished for the purposes of:

☐ international search (Rule 12.3(a) and 23.1(b))

☐ publication of the international application (Rule 12.4(a))

☐ international preliminary examination (Rule 55.2(a) and/or 55.3(a))

2. With regard to the **elements** of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report)*:

☐ the international application as originally filed/furnished

☒ the description:

pages 1-22 as originally filed/furnished

pages* _____ received by this Authority on _____

pages* _____ received by this Authority on _____

☒ the claims:

pages Claim nos. 2,3,9-14 as originally filed/furnished

pages* _____ as amended (together with any statement) under Article 19

pages* 1, 5-8 received by this Authority on 07-07-2004

pages* _____ received by this Authority on _____

☒ the drawings:

pages drawing nos. 1/4-4/4 as originally filed/furnished

pages* _____ received by this Authority on _____

pages* _____ received by this Authority on _____

☐ a sequence listing and/or any related table(s) – see Supplemental Box Relating to Sequence Listing.

3. ☒ The amendments have resulted in the cancellation of:

☐ the description, pages _____

☒ the claims, Nos. 4

☐ the drawings, sheets/figs _____

☐ the sequence listing *(specify)*: _____

☐ any table(s) related to sequence listing *(specify)*: _____

4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).

☐ the description, pages _____

☐ the claims, Nos. _____

☐ the drawings, sheets/figs _____

☐ the sequence listing *(specify)*: _____

☐ any table(s) related to sequence listing *(specify)*: _____

* *If item 4 applies, some or all of those sheets may be marked "superseded."*

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.
PCT/JP2004/000053

Box No. V **Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

1. Statement

Novelty (N)	Claims	1-3, 5-14	YES
	Claims		NO
Inventive step (IS)	Claims		YES
	Claims	1-3, 5-14	NO
Industrial applicability (IA)	Claims	1-3, 5-14	YES
	Claims		NO

2. Citations and explanations (Rule 70.7)

Document 1: US 5506704 A (Broer), 9 April 1996

Document 2: JP 2002-308832 A (Nitto Denko Corp), 23 October 2002

The inventions set forth in claims 1, 5 and 7 do not involve an inventive step in the light of document 1 cited in the international search report.

Document 1 (column 6, lines 16-22) indicates that a large gradient of light intensity can be obtained without taking any additional measures (in this case the addition of dye or the like) if a non-coherent radiation source is used whose wavelength is chosen to lie in the range where the maximum of the sum of the absorptions of the monomer used and the photoinitiator is found and it would be obvious to a person skilled in the art that if a monomer is used that absorbs a certain wavelength from the radiation, it is possible to eliminate additional measures. Moreover, generally, it would be easy for a person skilled in the art to assume that if the wavelength of the radiation source is ultraviolet light, a monomer capable of absorbing ultra-violet light is selected. The matter of selecting the light absorption

coefficient (mol) of the monomer can be achieved by a person skilled in the art according to necessity. Furthermore, although document 1 does not clear indicate whether the reflection bandwidth is greater than 200nm when a dye is not used, the reflection bandwidth is dependent on gradient of light intensity. In document 1, a relatively large gradient of light intensity is obtained when dye is not used and since it is preferable in document 1 that the reflection bandwidth is great, it is not possible to assume that it is impossible to obtain a reflection bandwidth greater than 200nm in document 1 without it being specifically described.

The inventions set forth in claims 2 and 3 do not involve an inventive step in the light of document 1. Document 1 (column 5, line 23 and below) indicates that the pitch of the molecular helix is governed to an important degree by the ratio between the chiral monomer and the mesogenic monomer and this ratio leads to a difference in reactivity between both monomers, hence it is possible to have one monomer with one reactivity and one monomer with a different reactivity. Therefore, a person skilled in the art would be able to select the reactive group of a mesogenic monomer and the reactive group of a chiral monomer as the two groups as appropriate and in doing so would fulfil the conditions set forth in claim 2 of the present application. Furthermore, since the invention set forth in claim 2 pertain to an object, it is also impossible to see the difference clearly between this invention and that in document 1 in terms of defining the direction of increase/decrease in change of pitch using the concept of

the ultraviolet radiation side.

The invention set forth in claim 6 does not involve an inventive step in the light of documents 1 and 2 cited in the international search report. Document 2 discloses a polymerisable mesogenic compound set forth in claim 6 and it would be obvious to a person skilled in the art from the point of view of its structure that this compound can absorb ultraviolet radiation. Therefore, there would be no difficulty in using the compound set forth in document 2 as the monomer for absorbing ultraviolet light in the invention disclosed in document 1.

The inventions set forth in claim 8-14 do not involve an inventive step in the light of documents 1 and 2 cited in the international search report. These additional measures are known features that could be used by a person skilled in the art as necessary.